



### HUMAN AND SOCIAL BIOLOGY

### UNIT 1 - Living Organisms and the Environment Situations

Lesson

**1**

## Characteristics of Living Things

### OBJECTIVES

At the end of this lesson you will be able to:

- a) list the characteristics of living things
- b) distinguish between living and non-living things
- c) explain each characteristic in detail



(See pages 6-9 in textbook)

### THE CHARACTERISTICS OF LIVING THINGS

It is not always an easy thing to tell the difference between living, dead, and non-living things. Prior to the 1600's many people believed that nonliving things could spontaneously turn into living things. For example, it was believed that piles of straw could turn into mice. That is obviously not the case. There are some very general rules to follow when trying to decide if something is living, dead, or non-living. Listed here are the six rules used by scientists:

- Living things are made of cells.
- Living things obtain and use energy.
- Living things grow and develop.
- Living things reproduce.
- Living things respond to their environment.
- Living things adapt to their environment.

If something follows one or just a few of the rules previously listed, it does not necessarily mean that it is living. To be considered alive, an object must exhibit **all** of the characteristics of living things. Sugar crystals growing on the bottom of a syrup container is a good example of a nonliving object that displays at least one of the criteria for living organisms.

Can you think of some other examples of nonliving objects displaying living characteristics?

### **DISTINGUISHING BETWEEN LIVING AND NON-LIVING THINGS**

We are surrounded by living and non-living things. All animals and plants are living things and biology is the study of these living things. A cat playing with a ball is obviously living. A pigeon flying from tree to tree is also a living thing.

Sometimes it is not so easy to decide. Plants are living things but they do not play with balls or fly. If something is living it will carry out all of the seven activities shown opposite.

Some non-living things show one or two of the seven characteristics of living things. Machines, such as washing machines, can move. The car needs to be fed with petrol in order to move.

- All living things grow, reproduce, are irritable, move, feed or show nutrition, excrete and respire.
- Non-living things do not carry out all of the characteristics above
- It may be difficult to observe all the characteristics in a particular organism, for example most plants move very slowly by growth movements
- Some non-living things may seem to grow or even move on their own but they are not made of cells like living things

### **CHARACTERISTICS OF LIVING THINGS DEFINED**

**GROWTH** – is a permanent increase in the size or mass of an organism by the addition of new cells to its body. If an organism is only made up of one cell then it grows by the addition of material to its cytoplasm.

**REPRODUCTION** – is the ability to produce more organisms just like themselves.

**IRRITABILITY** – is the ability to detect changes in the environment called stimuli.

**MOVEMENT** – is the ability to move part or the entire body, animals need to move to find food but plants do not move much as they make their own food.

**NUTRITION** – all living things require materials for energy, to grow, move and do everything else.

**EXCRETION** – this is the ability to get rid of waste by-products produced in the cells as a result of chemical reactions.

**RESPIRATION** – this is the process by which energy is released from food by chemical reactions which occur in cells.



## ASSESSMENT

Consider the following things and use the characteristics of life to determine if it is living or non-living by using your own knowledge of them.

- a.) A dog
- b.) A car
- c.) A virus
- d.) A mango tree.

**Also questions nos. 3-6 on pg. 14 in text.**